CLIMATE CHANGE REPORTING IN MALAYSIA: APPLICATION OF INSTITUTIONAL THEORY AND RESOURCE-BASED VIEW

by

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ABSTRAK

Kajian ini menganalisa tahap dan faktor pelaporan sukarela korporat mengenai perubahan iklim daripada 100 syarikat terbesar dari segi permodalan pasaran yang tersenarai di Bursa Malaysia. Kajian ini menggunakan kaedah kuantitatif untuk mencapai objektif tersebut. Satu rangka kerja bersepadu berdasarkan teori institusi dan pandangan berdasarkan sumber telah digunakan untuk menerangkan kepelbagaian amalan pelaporan perubahan iklim antara organisasi perniagaan. Idea utama rangka kerja ini adalah berdasarkan tekanan institusi dan sumber organisasi ke atas organisasi yang mengamalkan tanggungjawab sosial korporat secara strategik. Teknik *partial least square* telah digunakan untuk menilai hubungan di antara faktor-faktor tersebut dan pelaporan perubahan iklim. Kajian ini menunjukkan kecenderungan pelaporan perubahan iklim yang meningkat dari tempoh semasa kepada selepas Protokol Kyoto. Ia mencadangkan kesan positif usaha dan inisiatif kerajaan Malaysia ke atas peningkatan pelaporan tersebut. Umumnya, hasil kajian menunjukkan pelaporan tersebut lebih kepada maklumat kualitatif, terutamanya mengenai strategi perniagaan yang melibatkan perubahan iklim, dan bukannya data pelepasan gas rumah hijau secara kuantitatif. Selain itu, didapati bahawa organisasi perniagaan tidak begitu proaktif dalam melaporkan peluang dan risiko yang dihadapi berkenaan dengan perubahan iklim. Hasil kajian juga menunjukkan bahawa pemilikan kerajaan, pemilikan asing, keahlian rangkaian perniagaan lestari, kepelbagaian korporat, pengalaman antarabangsa organisasi dan pengalaman antarabangsa Ketua Pegawai

Eksekutif menpengaruhi pelaporan perubahan iklim secara positif. Sementara itu, keahlian industri sensitif iklim didapati tidak memberi sebarang kesan, sedangkan regangan organisasi menunjukkan hubungan songsang dengan pelaporan tersebut. Ini menunjukkan bahawa perubahan iklim telah diberi keutamaan tanpa mengambil kira industri yang terlibat. Selain itu, organisasi perniagaan juga mengalu-alukan operasi eko-kecekapan, yang dapat menjamin kemakmuran ekonomi di samping mengurangkan penggunaan sumber dan kesan terhadap alam sekitar. Selain itu, didapati bahawa peranan tanggungjawab sosial korporat secara strategik adalah penting dalam kajian ini. Tanggungjawab sosial korporat yang strategik merupakan pengantara hubungan yang signifikan antara tekanan institusi, regangan organisasi dan pelaporan perubahan iklim. Ia menunjukkan bahawa organisasi perniagaan telah memupuk amalan tanggungjawab sosial korporat secara strategik sebagai tindak balas kepada tekanan institusi dan regangan organisasi, yang kemudiannya menyebabkan amalan pelaporan perubahan iklim. Oleh itu, kajian ini memberi penekanan kepada keperluan menghayati tanggungjawab sosial korporat secara strategik, untuk menunjukkan komitmen organisasi perniagaan terhadap perubahan iklim. Secara keseluruhan, kajian ini menyumbang pengetahuan mengenai pelaporan perubahan iklim. Ia memperkayakan ilmu bidang tersebut dengan kajian empirikal ke atas faktor-faktor pelaporan, dan memperkenalkan peranan tanggungjawab sosial korporat strategik sebagai pengantara. Kesimpulannya, selain daripada tekanan institusi, sumber organisasi juga turut bantu dalam menerangkan pelaporan perubahan iklim secara sukarela di Malaysia.

CLIMATE CHANGE REPORTING IN MALAYSIA: APPLICATION OF INSTITUTIONAL THEORY AND RESOURCE-BASED VIEW

ABSTRACT

This research examines the extent and determinants of voluntary corporate climate change reporting of the largest 100 companies by market capitalisation listed on Bursa Malaysia. This research applies a quantitative approach to accomplish the objectives. An integrated framework was developed based on institutional theory and resource-based view to explain the variability of climate change reporting among business organisations. The main idea of this theoretical framework is based on institutional pressures and organisational resources towards businesses concerning their corporate social responsibility strategically. Partial least squares regression was then applied to assess the relationship between explanatory factors and climate change reporting. The findings reveal an increasing trend of climate change reporting from during the Kyoto Protocol to post-Kyoto Protocol period, suggesting the positive impact of the Malaysian government's efforts and initiatives on climate change reporting. Generally, there is more reporting of the qualitative information, especially the business strategies on climate change rather than the quantitative GHGs emission data. Besides, businesses have not been proactive in reporting their climate change related risks and opportunities. The findings also indicate that government ownership, foreign ownership, sustainable business network membership, corporate diversification, organisation international experience and CEO international experience influence climate change reporting positively. Meanwhile, no support for climate sensitive industry membership on climate change reporting, whereas

organisational slack had a significant inverse relationship with such corporate reporting. These imply that climate change is too costly to be ignored, regardless of industry, and businesses are looking forward to eco-efficiency operations, which secure economic prosperity while reducing environmental impact and resource intensity. Moreover, the presence of strategic CSR is crucial in this research. Strategic CSR significantly mediates the relationships between institutional pressures, organisational slack and climate change reporting. It suggests that business organisations internalise CSR strategically in response to institutional pressures and organisational slack, which subsequently lead to corporate climate change reporting. Therefore, this research advocates the need to internalise CSR strategically, in order to demonstrate business commitment towards climate change concern. Overall, this research contributes knowledge in corporate climate change reporting. It enriches the literature by empirically examining the reporting determinants, and introduce the role of strategic CSR as a mediator. To conclude, it is not only the strong influence of institutions, the internal resources also help in explaining the voluntary corporate climate change reporting practices in Malaysia.

CHAPTER 1

INTRODUCTION

1.1 Overview

In December 2014, serious flash flood in Kelantan, Malaysia after continuous rainfall for more than 12 hours. The floods were the worst of the past decades. In June 2015, severe heat wave struck southern Pakistan and killed many lives. These are just few examples that the climate is changing, which have been confirmed by scientists and well supported with scientific evidence (IPCC, 2007; 2014). Besides, scientific evidence also indicated that greenhouse gases (GHGs) emission is the major cause of global warming, which lead to climate change (IPCC, 2007; 2014). Increases in GHGs emission and climate change have negative economic impacts (Stern, 2006) as well as environmental and social effects (Bebbington & Larrinaga-Gonzalez, 2008). Hence, climate change has become a serious threat affecting human's quality of life.

Referring to the Fifth Assessment Report (AR5) published by the Intergovernmental Panel on Climate Change (IPCC), it clearly evidenced that human activities are affecting the climate system (IPCC, 2014). Thus, it is not surprising that there has been intense discussion about climate change and its related issues that focus on business organisations lately (Howard-Grenville, Buckle, Hoskins & George, 2014). In this view, governments and non-governmental organisations (NGOs) have urged business organisations to reduce their anthropogenic emissions of GHGs (Kolk, Levy & Pinkse, 2008). It is expected that the businesses are increasingly accountable for their environmental and climate change impact.

The heightened political and social concerns and mounting pressures towards climate change have led to the adoption of the Kyoto Protocol in December 1997 (UNFCCC, 2007). As an international legally binding agreement to combat climate change, the Kyoto Protocol set targets for developed countries to reduce GHG emissions. Besides, the European Union Emission Trading Scheme (EU ETS), which was launched in 2005, indicates the commitment of the European Union to address climate change through GHG emissions trading system. Apart from the governments and international treaty, such as the European Union, United Nations Framework Convention on Climate Change (UNFCCC) and IPCC, business organisations have begun to respond to global warming and climate change. They have responded proactively by voluntarily taking up emission reduction mechanisms and climate change reporting practices (Kolk et al., 2008). In fact, climate change has emerged as an important corporate agenda, and a key concern in corporate strategy formulation (Kolk & Pinkse, 2004; Amran, Ooi, Wong & Hashim, 2015), while systematic measurement and reporting is one of the business responses towards climate change (Hopwood, 2009).

The need to tackle climate change issues, especially GHG emissions, is considered as a strategic business challenge (Porter & Reinhardt, 2007; Andrew & Cortese, 2011). Climate change exposes business to various risks, uncertainties and opportunities (Lash & Wellington, 2007). Since human activity is associated with global warming (Bebbington & Larrinaga-Gonzalez, 2008; IPCC, 2007; 2014), and businesses suffer material risks through direct physical impact or indirect impact such as climate change policies, customer consumption preferences and changes in insurance premiums (Busch & Hoffmann, 2007), the provision of climate change performance information is crucial. Climate change reporting is the means to provide enhanced transparency

(Simnett, Nugent & Huggins, 2009). This information (GHG emissions data, climate change implications, opportunities and risks, as well as business mitigation and adaptation strategies) is required by the stakeholders to assist in investment decision-making (Andrew & Cortese, 2011; Sullivan & Gouldson, 2012; CDP, 2013).

In response to the stakeholder demand and pressures, many NGOs have undertaken initiatives to encourage business organisations to be more transparent with regard to their business related climate change performance. The Carbon Disclosure Project (CDP) is one of the pioneered initiatives that has been set up to fulfil the stakeholders' climate change reporting information needs (Kolk et al., 2008). Besides CDP, the Global Reporting Initiative (GRI) also provides sustainability reporting guidelines for business organisations to disclose their corporate governance, economic, social and environmental performance and impacts (GRI, 2013), including climate change reporting. The use of GRI guidelines is almost universal as 78% of the reporting organisations worldwide refer to GRI guidelines in their social responsibility and sustainability reports (KPMG, 2013).

Nevertheless, GHGs emission is still not regulated, and climate change reporting is still a voluntary practice in many of the developing countries (Luo, Tang & Lan, 2013; Amran, Periasamy & Zulkafli, 2014). Although an increasing number of researchers have examined corporate social and environmental reporting in the developed countries (Aerts, Cormier & Magnan, 2006; Brammer & Pavelin, 2008; Clarkson, Li, Richardson & Vasvari, 2008; Tagesson et al., 2009; Andrew & Cortese, 2011; Fortanier, Kolk & Pinkse, 2011), climate change reporting practices in the developing countries is still an unexplored area. While it is reported that the number of

organisations disclosing their corporate climate change and GHGs emission information has gradually increased (Kauffmann, Less & Teichmann, 2012; CDP, 2013), empirical evidence indicated that business organisations in developing countries are relatively low in adopting climate change reporting practices compared to developed countries (Luo et al., 2013; Amran et al., 2014). Thus, this stimulates researchers' interest to examine further the explanatory factors that drive voluntary corporate climate change reporting practices, especially in the developing countries.

Literature and the past studies into explanatory factors which determine the extent of corporate social and environmental reporting have mainly focused on corporate characteristics (size and industry affiliation) or external determinants (visibility, legal requirements) to explain such practices, based on stakeholder or legitimacy theory (Brammer & Pavelin, 2006; Clarkson et al., 2008; Hahn & Kuhnen, 2013; Luo et al., 2013). They discovered that businesses voluntarily report their corporate social and environmental information to meet stakeholders' expectation, and to gain legitimacy. Nevertheless, relatively less concerned with internal determinants on such reporting practices (Adams, 2002), and the majority of studies do not refer to any specific theory (Hahn & Kuhnen, 2013, p.14). In contrast to those studies, some researchers (Ray, Barney & Muhanna, 2004; Meyer, Estrin, Bhaumik & Peng, 2009) acknowledged the capacity of businesses to carry out their operations may be restricted by internal resources. Since climate change reporting is part of an overall corporate climate change strategy, which require reasonable resources (Luo et al., 2013), organisational resources are considered as an internal determinant that may affect the extent of climate change reporting in this research.

Besides, with the increasing concern of businesses to address social and environmental issues, short term profit maximisation, once considered as the ultimate business objective is slowly overshadowed by corporate social responsibility (CSR) (Heslin & Ochoa, 2008). In fact, there is an increasing demand for CSR activities from business stakeholders, which further encourage the adoption of CSR practices among businesses (Chapple & Moon, 2005). The growing concern of social and environmental irresponsible behaviour of businesses is very much related to business activities that have enormous impacts on the environment (da Silva Monteiro & Aibar-Guzman, 2010; Jones, 2010). Herewith, CSR has emerged as an important subject in the company's activities, which calls for responsible business practices. Realising the importance of CSR and sustainable development, it is essential to embed climate change reporting as a strategic CSR practice. Businesses are now expected to report their climate change performance in a more transparent manner.

In Malaysia, through the release of MYCarbon GHG Reporting Guidelines in 2013 (NRE, 2014), regulators and policy makers have recognised the need for businesses to report their climate change related information. In spite of climate change reporting is still a voluntary practice, the Malaysian government had played their significant role in helping businesses to manage, report and reduce GHGs emission since the mid 70's, as the environmental and climate change concerns are gradually being emphasised in the Malaysia development plans, as early as in the Third Malaysia Plan (1976-1980) (Hezri & Hasan, 2006; NRE, 2009; Economic Planning Unit, 2010). Moreover, many environmentally related policies, such as the National Policy on Climate Change (NRE, 2009) and incentives (Begum, Abidin & Pereira, 2011) have been introduced. Businesses are encouraged to report their climate change related information

voluntarily. However, climate change reporting in Malaysia is still not a popular practice, the extent of climate change reporting is relatively low in Malaysia (Amran et al., 2014).

Therefore, this research intends to identify the determinants that drive Malaysia business organisations to voluntarily report their climate change information, and understand the extent of such reporting practices. The empirical effort of this research is built upon institutional theory. Institutional theory explained the homogeneity of an organisation's practices, which converge as a response to isomorphic pressures. Isomorphic pressures force the organisation to adopt institutional practices to become legitimate within the specific institutional environment (DiMaggio & Powell, 1983; Scott, 2001; 2008). A broad literature has emerged over the years demonstrating that stakeholders and institutional pressures influence organisation's environmental practices. With readily available information about corporate climate change information, the general public, investors and stakeholders are enabled to exert pressure on organisations, forcing them to be more environmentally friendly (Liu & Anbumozhi, 2009; Zeng, Xu, Yin & Tam, 2012). However, organisations subject to the same level of institutional pressure practice and strategize differently (Delmas & Toffel, 2011). Oliver (1997) suggested that the organisation resources have an important influence on organisational heterogeneity. The availability of resources plays an important role in carbon mitigation and reporting practices, especially in the developing countries (Luo et al., 2013). Additionally, CSR signals an important part in environmental accounting and reporting, as businesses have a duty to act responsibly (Jones, 2010). Therefore, a research effort is now being made to integrate institutional theory and resource-based view (Barney, 1991) to construct a theoretical

framework to explain organisational heterogeneity in climate change reporting in Malaysia, mediated by strategic CSR. Figure 1.1 summarises the relationships and focus of this research.

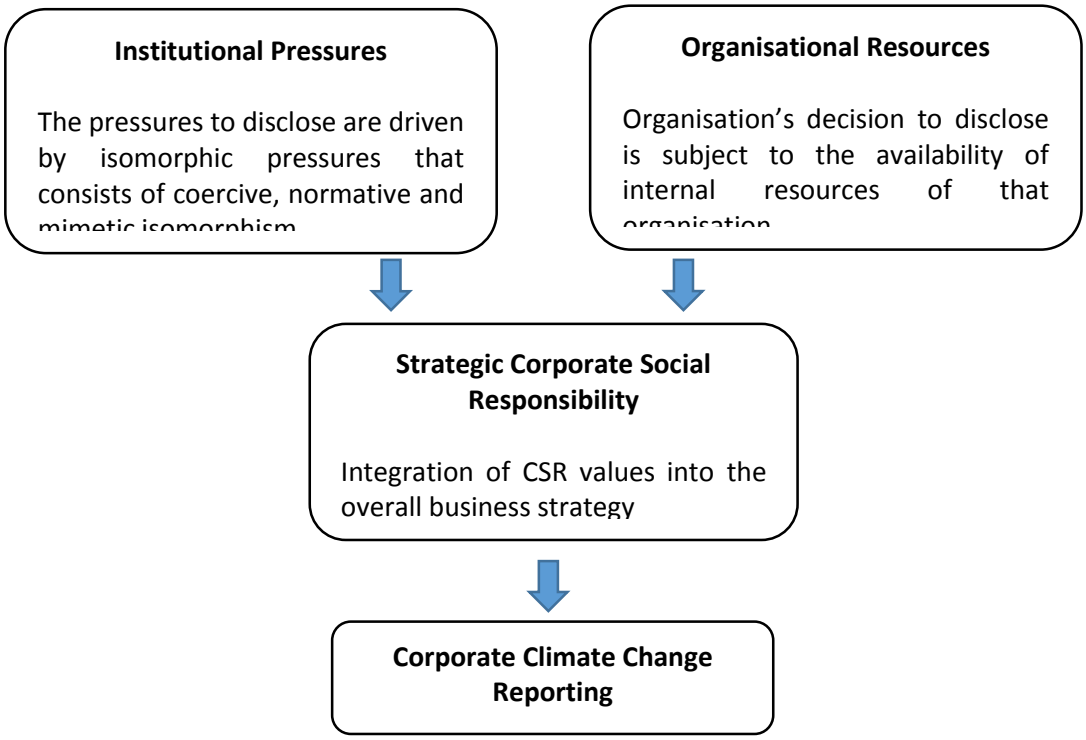

Figure 1.1. ***Focus of the Research***

1.2 Background

Awareness of climate change is growing and there is increasing demand for public information on how businesses conducted in the climate change context. Business organisations are expected to conduct their business in a responsible and transparent manner. Hence, it is crucial to provide accurate and clear information to satisfy the growing demand for climate change information. Corporate climate change reporting has become a means for businesses to communicate their climate change performance to enhance their corporate reputation (Othman, Darus & Arshad, 2011). Given this challenge, there is a need to review climate change reporting developments. A good

understanding of the background of climate change reporting, is the very first step to explore further into this climate change reporting subject.

1.2.1 Corporate Responsibility towards Sustainable Development

Noticing the devastating climate change impacts and business implications of climate change, sustainable development has been of growing concern lately. Sustainable development matters to businesses, as they need to share the environment with others to operate continuously. A sustainable business is one that considers its impacts on the environment and society while maintaining financial profitability (Herzig & Schaltegger, 2006; Schaltegger, Bennett & Burritt, 2006).

The devastating climate change impact not just affect the environment (landslides, intensified droughts and flooding) for a long period, but also causing extensive damages to properties and even human lives (IPCC, 2007; 2014; UNFCCC, 2007; ADB, 2009). The consequences would hinder both social and economic developments. Therefore, immediate actions must be taken to assure that the three pillars of sustainable development are attained. The responsibility rests on businesses. Businesses are part of the community, thus should behave in a socially responsible manner to face the social and environmental problems, address the challenges, manage the resources well and thus contribute to moving society towards a sustainable future.

Since business and society are interdependent, they are facing increasing demands from NGOs and other institutional communities for responsible corporate practices (Arenas, Lozano & Albareda, 2009; Yu & Choi, 2014). Besides, criticism of business

impacts has increased, and public expects them to pay greater attention to corporate responsibility initiatives (Orlitzky, Schmidt & Ryne, 2003). Hence, corporate responsibility has become an increasingly important consideration for business nowadays towards sustainable development. For instance, Malaysian Resources Corporation Berhad (MRCB) emphasis on corporate responsibility towards sustainable development, they have consciously initiated the green development strategy (green building) for all existing and future development projects (MRCB, 2012).

Businesses can no longer ignore corporate responsibility to achieve sustainable development. In fact, businesses should strategically engage in corporate responsibility, integrates it into day-to-day business operations. A strategic corporate responsibility helps business organisation to plan and execute its CSR practices, which align the overall corporate strategies with the demanding and dynamic business environment in order to fulfil stakeholder expectations (Galbreath, 2009; Sekhar Bhattacharyya, 2010; Orlitzky, Siegel & Waldman, 2011), which further helps to increase the overall competitiveness of that business.

As businesses are expected to conduct responsible business to address relevant social and environmental issues, especially with the rise of scientific (IPCC, 2007; 2014; ADB, 2009), economic (Stern, 2006) and regulatory (ACCA, 2002; Cooper & Pearce, 2011) concerns about climate change. Climate change reporting is an important communication practice to show that the company is aware and attentive to its business related climate change performance, and it is an important corporate responsibility for

businesses to demonstrate transparency, accountability and effective governance (Subramaniam, Hodge, & Ratnatunga, 2006) to their stakeholders.

1.2.2 Business and Climate Change

Since the early 1970s, businesses have been identified as the culprits and the main contributors to environmental pollution (da Silva Monteiro & Aibar-Guzman, 2010). International bodies like the Association of Chartered Certified Accountants (ACCA, 2007) and Intergovernmental Panel on Climate Change (IPCC, 2007) highlighted that businesses as the generator of economic growth, have resulted in significant environmental and climate change impacts. Human induced activities such as rapid industrialisation, highly dependent on fossil fuels along with deforestation are widely known as the main causes of global warming and climate change (IPCC, 2007; 2014; ADB, 2009). Specifically, anthropogenic carbon emissions have been identified and proven as the primary cause of climate change (Busch & Hoffmann, 2007; Weinhofer & Hoffmann, 2010). The increase of GHGs concentration in the atmosphere will cause global warming, which then leads to climate change.

The six GHGs focus by the Kyoto Protocol are carbon dioxide (CO_2), sulphur hexafluoride (SF_6), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) (UNFCCC, 2007) as these gases trap heat, disseminate it within the atmosphere and raise atmospheric temperatures. The most important and pervasive GHG is CO_2, which has increased about 35% from pre-industrial level (IPCC, 2007). Due to business activities, the global CO_2 concentration has increased

drastically, far exceeded the pre-industrial level of 280 parts per million (ppm) to 379 ppm in 2005, and projected to reach 550 ppm by 2050 (Stern, 2006).

1.2.3 Business Implications of Climate Change

The significant climate change impacts put many businesses at risk. Climate change affects business as in profitability and values (Hague & Deegan, 2010). The IPCC differentiates the impacts in two broad types: direct and indirect impacts on business (IPCC, 2007). Direct impacts included observable signs of climate change like temperature increase, sea levels rising and increase of extreme weather events (such as intensified droughts and floods trigger by El Nino and La Nina phenomena, as well as increased of tropical peak wind intensities and storms), which harm human lives and destruction of properties and infrastructures directly; whereas indirect impacts arise from the shift in social, economic and political structures (Busch & Hoffmann, 2007; Cuevas, 2011; IPCC, 2007; 2014). Political and regulatory compliance can be seen as the indirect impacts of climate change on business. The regulatory risks cover the cost of GHG emissions, energy saving technologies and mandatory GHG and energy reporting (Hague & Deegan, 2010).

Growing awareness on the consequences of climate change will affect consumer preference and demand (Hague & Deegan, 2010). According to Busch and Hoffmann (2007), climate change could become a mainstream consumer issue with reputation implications for business, leaving unprepared business at risk. This is supported by a survey carried out by McKinsey, which revealed that businesses may take this as an opportunity to differentiate themselves from their competitors, they can position

themselves as social and environmental responsible companies which provide climate friendly products and services to improve their reputations (Bonini, Hintz, & Mendonca, 2008). In fact, over half of the consumers are willing to purchase energy efficient products, to drive fuel-efficient vehicles and to recycle. Besides, they would even prepared to pay more for environmentally friendly products (Bonini et al., 2008). This indicates that changes in consumer consumption patterns and business should focus on consumers' environmental concern and applied it in its' business strategies for competitive advantage.

Besides the political and regulatory risks, as well as the social concern (consumer preferences), Professor Sir Nicholas Stern brought business related climate change impacts into picture by stating that human activities over the near future, which closely related to climate change, would put the global economy at risks (Stern, 2006). The report also stated that by mid of the century, the costs of extreme weather could easily reach 0.5–1.0% of the world Gross Domestic Product (GDP) per year. Therefore, every business will be affected by climate change in some ways (Busch & Hoffmann, 2007; Lash & Wellington, 2007), and businesses have to consider climate aspects as an economic factor in their business strategy.

According to Lash and Wellington (2007), anthropogenic climate change poses unique challenges to business. The significant effect on most businesses, whether it is an opportunity or threats, directly or indirectly through supply chain or transportation, affected the business. The most important point is that business must be aware of the need and the urge to plan and prepare the resources and knowledge for climate change. Urgent action is needed because earlier action cost is much lesser to avoid the impact

of climate change (Stern, 2006). Besides, correspondingly to the concern surrounding climate change risk and its detrimental impact, businesses, as the main GHGs emitter, should be accountable for their action. Businesses are starting to reveal information on climate change impacts through climate change reporting (Solomon, Solomon, Norton & Joseph, 2011).

1.2.4 Climate Change

Climate indicates a long-term average of weather condition, over a specific period and geographical area, depending on the latitude, mountains, forests, distance to the sea and other geographic characteristics. Whereas, climate change is referring to the "statistically significant variations of the mean state of climate or its variability, typically persisting for decades or longer". Meanwhile, the weather is the condition of the atmosphere at a given location and time, depending on the temperature, moisture, rainfall and wind velocity. The weather is inconsistent; it changes quickly from time to time, while the climate changes on much longer time scales comparable to weather (Cuevas, 2011).

Climate change is a reality and the phenomena has already been observed over a long period. Climate change can be measured through observations. Although its effects may vary among different parts of the world, the atmospheric average temperature increased is one of the most obvious signs of climate change. Besides temperature, changes of precipitation, rise of sea level, decrease of glaciers, melting of ice and increase of extreme weather events are the other observations of climate change (IPCC, 2007; 2014). As reported in AR5, the last three decades (1983-2012) were likely to be

the warmest of the last 1400 years (IPCC, 2014). The continuous warming trend is no doubt as evidenced in the Fourth Assessment Report (AR4) revealed that the planet has experienced an increase of 0.74°C over the last century (1901-2000), nevertheless, as reported in AR5, an increase of 0.85°C was recorded over 1880-2012 (IPCC, 2007; 2014).

Specifically, the IPCC (2007; 2014) had revealed that as human activities are changing and intensifying the climate system, the global average temperatures are estimated to surge within 1.4-5.8°C during 1990-2100. The IPCC also concluded that the further warming process would result more climate changes, especially with the continuous GHG emissions at or above current rates. Furthermore, a projection of 0.2°C increase in average temperature per decade will be observed under a range of simulated emission conditions, and it is interesting to note that despite all GHG emissions been kept constant at the level of year 2000, an increase of 0.1°C per decade will be foreseen (IPCC, 2007).

Warming of the climate system is obvious, as the atmosphere and the ocean have become warmer, the bulk of snow and ice are decreasing, and the sea level is rising (IPCC, 2014). Global sea levels rose with the increase of global average temperature and decrease of Arctic sea ice extent by 2.7% each decade. Thus, the lesser sea ice extent left, especially in the summer time. Moreover, the melting of glaciers and ice were also contributed to the rose of sea levels and soil erosion, therefore coastal areas and low lying deltas will be at greater risk of flooding (IPCC, 2007). Besides, variability in precipitation is also been observed during climate change (IPCC, 2007; 2014; Cuevas, 2011). Changes in patterns of precipitation are expected to cause

droughts and floods. As stated by Cuevas (2011), with anomaly in precipitation and rise in temperature, variation as in duration, frequency and intensity of tropical storm and hurricane would be significant.

All of the observations, evidence and projections indicated that climate change is accelerating (IPCC 2007; 2014) and will lead to extended consequences on the environment, social and economic development globally (Stern, 2006; Bebbington & Larrinaga-Gonzalez, 2008) involving agriculture, water resources, food security and human health (UNFCCC, 2007; IPCC, 2014). If the global temperature continues to rise and exceed 1–3°C, the world would face negative consequences on biodiversity and the ecosystem. The ecosystem structure and functions, water and food supply would be affected which increased the risk of habitats, plant and animal species extinctions. Then, crop productivity would also be affected by floods or droughts which will further lead to starvation. Besides environmental and economic consequences, increases in extreme weather events will also have negative impacts on the lives and health status (IPCC, 2007; 2014; UNFCCC, 2007). The impacts of climate change have led to worldwide sustainable development concern and lead to the termed dangerous climate change (Bebbington & Larrinaga-Gonzalez, 2008).

Nevertheless, climatic researches indicated that the worst climate change related disaster is yet to come (ADB, 2009). Due to its far reaching impact (geographic coverage and time horizon), climate change has emerged as one of the most important sustainable development issues. Carbon dioxide is the main GHG causing global warming and subsequent damages to the environment. Thus, climate change caused by GHGs emission is arguably the largest challenge of achieving sustainable

development, especially for the developing countries in Asia (IPCC, 2007; ADB, 2009).

1.2.5 Kyoto Protocol

Noticing the climate change impacts, countries worldwide have begun to respond to it by reducing their GHGs emission. The international effort and commitment to constrain GHGs emission had led to the establishment of the Kyoto Protocol, which came into force on 16 February 2005 to combat climate change. Many industrialised countries (the Annex I countries), have signed the Kyoto Protocol and they are committed to reducing their GHGs emission. These countries must not exceed their allowable level of GHGs emission, meanwhile the developing countries (non-Annex I countries) are not mandated but they are encouraged to reduce their emissions (UNFCCC, 2007).

A key feature of the Kyoto Protocol is the targets for Annex I countries to reduce their GHGs emission by about 5% from 1990 levels within the 2008-2012 commitment period (UNFCCC, 2009). To reduce GHG emissions cost-effectively, the Kyoto Protocol established three innovative market-based mechanisms to facilitate sustainable development and GHGs emission reductions. Three mechanisms: Clean Development Mechanism (CDM), joint implementation (JI), and emission trading (UNFCCC, 2007; Lim & Lam, 2014) were introduced to help industrialised countries to achieve their emission reduction target with considerable flexibility and at lower costs in other countries than at home.

Malaysia became a non-Annex I party to the United Nations Framework Convention on Climate Change (UNFCCC), and ratified the Kyoto Protocol in 2002 (NRE, 2011). As a non-Annex I country, Malaysia has no quantitative commitment to reduce GHG emissions, however, Malaysia voluntarily participate in GHGs emission reduction projects. Malaysia has actively participated in the CDM projects. As of 31st October 2013, there were a total of 7366 registered CDM projects. Referring to the data published by UNFCCC, Malaysia hosted 1.94% of these projects (UNFCCC, 2013). Malaysia earns certified emission reduction (CER) credits while engaging in CDM projects, which can be traded to Annex I countries. It seems that with the involvement in CDM projects, Malaysia has a huge potential in carbon trading market. It has been recorded that the annual CER potential in Malaysia achieved 18 million in 2010, which is equivalent to about 100 million tonnes of CO_2 equivalent within the 2006-2012 period (Lim & Lam, 2014). Despite the number of CDM projects is still low compared to China, India, Brazil, Vietnam and Mexico (UNFCCC, 2013), it is obvious that Malaysia is highly supportive in reducing GHGs emission in the international arena by ratifying the Kyoto Protocol.

The Kyoto Protocol is considered as the first important step towards a worldwide GHGs emission reduction. As sustainable development is the key concern nowadays, significant effort is needed to reduce GHG emissions beyond the Kyoto Protocol. A continuous way forward is needed to address the threat of climate change, especially post-Kyoto Protocol.

1.2.6 Basic Concepts Related to Climate Change Reporting

Climate change reporting lies in the overarching concepts of sustainability and CSR. Referring to the worldwide standard for social responsibility, ISO 26000, CSR has been defined as the "responsibility of an organization for the impacts of its decisions and activities on society and the environment, through transparent and ethical behaviour" (ISO, 2010, p.3). Similarly, the European Commission (2011, p.6) termed CSR as "the responsibility of enterprises for their impacts on society". Businesses need to "integrate social, environmental, ethical, human rights and consumer concerns into their business operations and core strategy" (European Commission, 2011, p.6) to meet CSR. Both of the definitions directly linked to sustainability concept.

Meanwhile, sustainability concerns meeting the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987), which is also the main concern of businesses. To obtain sustainability, businesses need to identify the distinct aspects of corporate sustainability, and establish specific sustainability strategies, covering environmental, economic and social aspects (Schaltegger et al., 2006; Baumgartner & Ebner, 2010). Over time, dynamic and simultaneous interactions happen, gradually converging CSR and sustainability elements in businesses, integrating environmental, social and financial performance (Hahn & Kuhnen, 2013). It is the ability of the organisation to be endured and maintained.

Based on the underlying concepts of CSR and sustainability, corporate performance is measured by sustainability related accounting. The sustainability accounting supports

internal decision-making in relation to corporate sustainability (Herzig & Schaltegger, 2006; Hahn & Kuhnen, 2013), hence serves as a foundation for sustainability related reporting. Based on the accounting data, sustainability reporting, as a means of communication, provides corporate sustainability related information to its stakeholders (Herzig & Schaltegger, 2006). Figure 1.2 illustrates the basic concepts relating to climate change reporting.

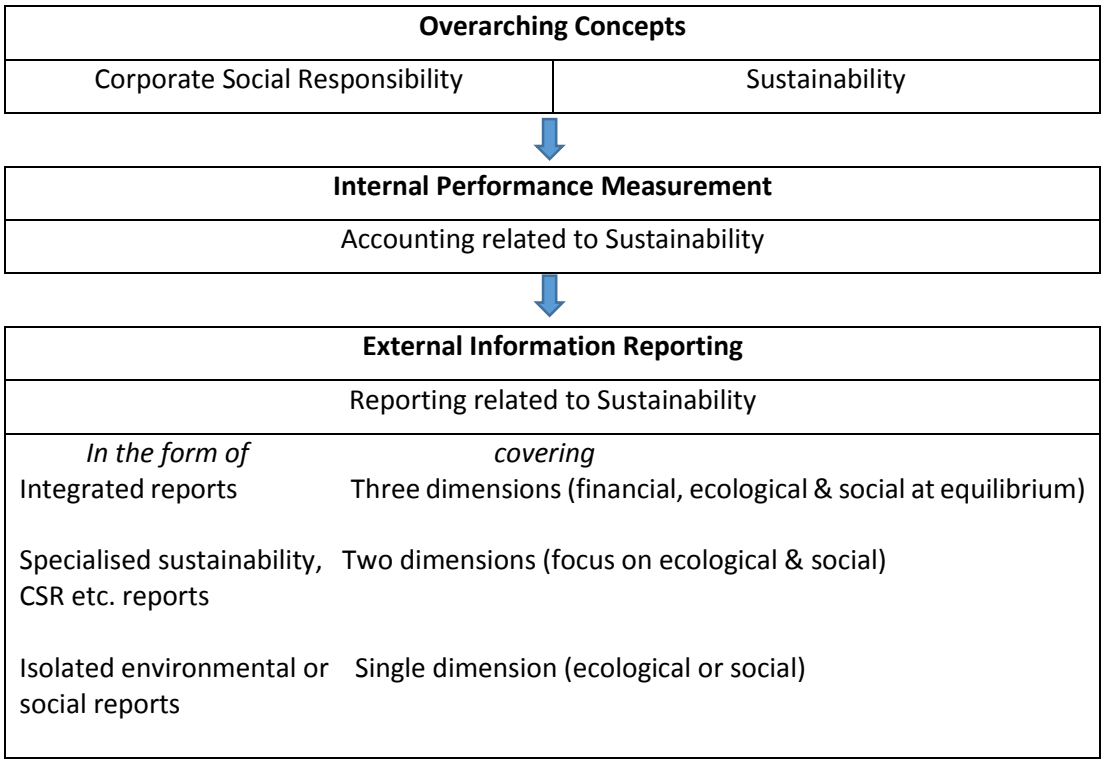

Figure 1.2. ***Overview of Basic Concepts relating to Climate Change Reporting*** (adapted from Hahn & Kuhnen, 2013)

Given the severity of climate change, it would seem prudent for business to be accountable for it, there is a need to measure and assess business climate change impact (Jones, 2010). Hence, climate change reporting as a sustainability tool (GRI & KPMG, 2007) seems to be a communication channel to demonstrate transparency, accountability and effective governance (Subramaniam et al., 2006; Simnett et al., 2009) towards sustainable development.

Climate change reporting is premised on the concept of sustainable development practices. It provides climate related information to stakeholders about corporate attempts to manage the issues and make corporations held accountable for its impacts (Bebbington & Larrinaga-Gonzalez, 2008). Climate change reporting should not be limited to conventional accounting and reporting, but to incorporate risks and uncertainties associated with climate change. This non-financial reporting is indeed necessary to provide relevant information about the risks associated with climate change in order to reflect the true view of business performance (Bebbington & Larrinaga-Gonzalez, 2008).

In light of sustainability reporting is still voluntary in nature, businesses are flexible in disclosing their corporate sustainability related information. Although there is an increasing trend toward integrated reporting (KPMG, 2011), whereby sustainability information is integrated with financial information in a single report; there are other forms of sustainability related reporting (refer Figure 1.2). Referring to Hahn and Kuhnen (2013)'s sustainability dimensions' categorisation, social aspects cover occupational health and safety, human resources, labour and human rights. Meanwhile, environmental aspects cover climate change, GHG emissions and environmental management practices, whereas pure integrated reporting, includes financial aspects and it is termed as TBL (triple bottom line) reporting practices. Thus, climate change reporting is a single dimensional sustainability related reporting, which covers isolated aspects of sustainability.

1.2.7 Climate Change Reporting in Malaysia

Over the past decade, there has been an increasing pressure on businesses to measure, manage and report on their climate change performance (Cotter & Najah, 2013). Businesses in Malaysia have also started to report their business related climate change information publicly. Generally, developed countries report more climate change and sustainability related information, however, the extent of climate change reporting in Malaysia is still lacking behind Thailand, Singapore and Philippines (Amran et al., 2014).

In order to promote climate change and sustainability elements among business organisations in Malaysia, in 2009, Malaysia formulated its National Policy on Climate Change, to guide Malaysians in identifying the opportunities and addressing the challenges of climate change towards sustainable development nation (NRE, 2009). Apart from that, Bursa Malaysia published "Powering Business Sustainability: A Guide for Directors" to assist businesses in applying the principles of good corporate responsibility and sustainability (which covers climate change issues), as well as reporting on sustainability performance among listed companies in Malaysia. Additionally, MyCarbon GHG Reporting Guidelines was published in December 2013 to assist businesses in managing and reducing GHGs emission. Business organisations are required to use the guidelines in reporting their GHG emissions (NRE, 2014). Prior to that, ACCA (2005) published sustainability reporting guidelines for Malaysian companies, as its continuous effort in sharing best practices on sustainability reporting. On top of that, Bursa Malaysia launched its CSR Framework in 2006, and in 2007, all

public listed companies in Malaysia are required to report relevant and material social and environmental information in their annual reports.

Besides, in order to transform Malaysia into an advanced nation by 2020, the New Economic Model (NEM) was introduced in March 2010, as one of the four pillars of national transformation towards Vision 2020. The NEM is to be accomplished through Economic Transformation Programme (ETP). Meanwhile the ETP is set to be driven by eight Strategic Reform Initiatives (SRIs) (NEAC, 2010). This NEM is the way forward that all Malaysians should be aware and pursued. Its successful implementation is very much dependent on the commitment of all Malaysian stakeholders. Corporate climate change reporting is a timely practice, as it relates to two of the SRIs, which is (1) transparent and market-friendly affirmative action, and (2) ensure sustainable growth. Hence, climate change reporting may become an important tool to drive NEM to its realisation.

Despite Malaysian government's efforts are obvious, climate change reporting is not a mandatory practice in Malaysia. Based on previous research, some Malaysian businesses are reporting on issues related to climate change and global warming (Amran et al., 2012; Amran et al., 2014; Ahmad & Hossain, 2015). Based on the findings from Ahmad and Hossain (2015), companies in Malaysia mainly reports on six issues, which covers energy saving and efficiency, air pollution, preserving biodiversity, tree plantation, global warming and the Kyoto Protocol agreement. Among the reported climate change issues, energy saving and efficiency, is the most emphasised issue, as 65.82% companies reported such information. Additionally, very few companies (7.59%) report quantitative information about GHG emissions.

Similarly, Amran et al. (2012) also revealed that only 8% of the sample companies reported their GHG emissions data. It has been recorded that 41% of the companies mentioned the term global warming or the Kyoto Protocol, and 37% of the companies planned to deal with global warming and to control global warming (Amran et al., 2012). Hence, climate change reporting in Malaysia is rather qualitative in nature.

Referring to prior literature (Amran et al., 2014; Ahmad & Hossain, 2015), climate change reporting in Malaysia is still at the introductory stage. Nonetheless, the formulation of National Policy on Climate Change, NEM, and MyCarbon GHG Reporting Guidelines, signifies the external governmental pressures that influenced business organisations to adopt and practice climate change reporting. With these pressures, it is expected that businesses will engage in more CSR and sustainability related practices.

1.3 Problem Statement

Climate change concerns, based on the compelling science and an increasing number of devastating impacts are becoming increasingly urgent (IPCC, 2007; 2014; UNFCCC, 2007; ADB, 2009). As a responsible nation, Malaysia made a strong commitment to reduce 40% of its carbon emissions by 2020 compared to its 2005 level during the 2009 Copenhagen Climate Change Summit (NRE, 2011). Most importantly, the National Policy on Climate Change was formulated in 2009 and Malaysia had ratified the Kyoto Protocol in 2002. To meet the commitment, climate change reporting is crucial whereby organisations demonstrate their accountability, transparency and effective governance to their stakeholders. Climate change reporting

is probably the most suitable evidence to showcase corporate climate change performance. Although climate change reporting is a voluntary practice in Malaysia, all of these showed that the government is concerned and aware of climate change impacts. This may spur further the development and implementation of climate change reporting standards and regulations in response to the current society's growing expectation about climate change and business accountability.

As a response to the increasing pressure from investors and stakeholders (ACCA, 2005; KPMG & GRI, 2007; Sullivan & Gouldson, 2012; Cotter & Najah, 2013) to report climate change related information, there has been an increasing numbers of environmental reporting from different countries (Brammer & Pavelin, 2008; Prado-Lorenzo et al., 2009; Zeng et al., 2012), but very little is known about climate change reporting (Haque & Deegan, 2010). Thus, urgent measures are required to tackle climate change related issues (Bebbington & Larrinaga-Gonzalez, 2008; Hopwood, 2009), businesses need to report their climate change impacts as transparency is recognised as the essential element of corporate accountability. When businesses are being encouraged to reduce their climate change impacts, it is likely that the demand for climate change reporting, as a means to deliver accountability will increase. Despite lots have been mentioned about climate change seriousness and business challenges (Kolk & Pinkse, 2004; Busch & Hoffmann, 2007; Weinhofer & Hoffmann, 2010; Howard-Grenville, et al., 2014), the extent of environmental and climate change reporting in Malaysia has been very low (ACCA, 2002; Othman & Ameer, 2010; Amran et al., 2012; Amran et al., 2014).